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HOUSEHOLD CONSUMERS' ACCEPTANCE OF AN EXPERIMENTAL

DRY WHOLE MILK

U.S. DEPT. OF AGRICULTURE
STATISTICAL REPORTING SERVICE

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STATISTICAL REPORTING SERVICE

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PREFACE

This study was designed to provide information about consumer acceptance of a dry whole milk powder developed by the Dairy Products Laboratory, Eastern Utilization Research and Development Division, Agricultural Research Service, U. S. Department of Agriculture.

The Special Surveys Branch, Standards and Research Division, Statistical Reporting Service, USDA, assumed responsibility for the conduct of the study, which is part of a program of research aimed at determining consumer reactions to agricultural products. Agricultural Research Service provided the test product and contributed a portion of the research costs. Advice was provided in the planning stage by other services in the Department.

The project was under the general direction of Margaret Weidenhamer, Chief, Special Surveys Branch. L. Yvonne Clayton was responsible for the coding phase. Two former employees also assisted: Edward J. McGrath, in the planning and study design phases; and Marybeth Rosa, in the analysis. The Social Research Group, George Washington University, Washington, D. C., under contract with the U. S. Department of Agriculture, conducted the study and prepared a draft report.

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HIGHLIGHTS

An experimental dry whole milk powder that reconstitutes into fluid whole milk won favor among over 300 homemakers in Alexandria, Va., who tried it in their homes. Considering their families' overall needs and preferences, four homemakers in 10 rated the dry whole milk equal to or better than regular whole milk.

In these households, the majority of members age 12 and over who normally drank milk liked the test product as a beverage. However, on the average the ratings they gave it on a 9-point hedonic scale were not as high as the ratings they gave regular whole milk. The majority of children under age 12 who tried it as a beverage liked it as well as or better than regular whole milk, according to homemakers' reports.

More than half the homemakers had also used the test product in cooking or baking, on cereal, or some other way, such as in coffee or tea. The majority of these homemakers considered the dry whole milk equal to or better than regular whole milk for these purposes.

In general, the reactions were equally favorable whether the weekly milk consumption reported for these households fell into the lower, middle, or higher usage level group.

Ease of storage seemed to be the major attraction to the three homemakers in four who felt there were advantages in using the dry whole milk. More than half the homemakers mentioned some disadvantages; the main objection was that the test milk takes time to mix. A primary concern to the dry whole milk developers was the reaction of consumers to the foam that appears on top of the reconstituted milk, but only one-fourth of the homemakers who reported any disadvantages (about 15 percent of all homemakers interviewed) mentioned the foam formation.

In discussing the advantages of the dry whole milk, many of the homemakers had assumed that it would sell for less than regular whole milk. In response to an attitude question about the highest price at which they would buy any of the test product for use as a beverage, a majority of the two homemakers in three who might be willing to purchase it stipulated that the price per quart equivalent would have to be below that for regular whole milk; one homemaker in three indicated no interest in buying it for use as a beverage at any price.

HOUSEHOLD CONSUMERS' ACCEPTANCE OF AN EXPERIMENTAL DRY WHOLE MILK

by
Evelyn F. Kaitz
Standards and Research Division
Statistical Reporting Service

INTRODUCTION

The Dairy Products Laboratory, Eastern Utilization Research and Development Division (EURDD), Agricultural Research Service, has been carrying out research to develop a dry whole milk powder that is manufactured by a foam spray-dry process and that reconstitutes to milk of beverage quality. The Engineering and Development Laboratory, EURDD, also has developed a whole milk powder through use of a vacuum foam-drying process. The results of a market test on this product have been published. 1/

Sufficient research had been carried out to establish the packaging and storage conditions necessary for commercial use of the foam spray-dried whole milk powder if it is distributed under refrigeration. The dry whole milk had been tested by both trained and untrained taste panels within the Department. Both groups found the product acceptable and comparable to fresh whole milk. Therefore, the developers were interested in consumers' reactions to the flavor, the residual surface foam on the reconstituted milk, and the time and effort required to reconstitute the milk product.

The findings reported on here are based upon personal interviews with 327 homemakers selected by area probability sampling procedures in the incorporated city of Alexandria, Va., during the fall of 1965. Only private households were selected. As in all surveys where a sample is interviewed rather than the total population, the findings are subject to sampling error. A description of the sample design, sampling method, and sampling tolerances appears at the end of this report.

At each household where an eligible respondent was contacted, the interviewer explained the purpose of the study. An initial, or "placement," interview was conducted with the cooperating homemakers to obtain information about the use and reasons for nonuse of different kinds of milk, the total amount of milk used each week, and pertinent demographic data. The demographic data are appended to this report.

1/ Sills, Morris W. Market Test of Dry Whole Milk: Nine Supermarkets, Lansdale, Pa., Area, U. S. Dept. Agr., ERS-433, Jan. 1970, 34 pp.

At the conclusion of the initial interview, the respondents were given a supply of the new dry whole milk product. Although the number of cans left at each household was determined by the amount of milk being used each week as a beverage, at least two cans of the test milk were left at each household. Each can reconstituted to a fluid quart of whole milk.

The homemakers were asked to serve the new product as a beverage at least once to each household member age 12 or older who normally drank milk. Each of these eligible household members was to complete a preference rating card that asked about reactions to both the test milk and regular whole milk as a beverage.

About a week after the initial interview and test milk placement, interviewers called on the cooperating homemakers to ascertain their opinions of the test milk and their reports of the reactions to the test milk of household members under age 12 who had tried it. During that visit, the interviewer also collected the preference rating cards that had been completed by the household members age 12 and older who had evaluated the test product as a beverage.

Practically all of the respondents in this survey were female and most of them represented households of one to four persons. The majority of the homemakers were under age 45, not employed, had completed high school or some college, and had a total annual family income of \$5,000 or more.

Some of the questions allowed for multiple replies by respondents; thus, percentages in some of the following tables may add to more than 100 percent. The "miscellaneous" categories of information, shown throughout the tabulations, are the merging of all the ideas or items that individually were given by no more than 2 percent of the respondents in reply to the particular question.

Copies of the questionnaires; the instructions given to the homemakers for mixing, using, and rating the test product; the preference rating card; the label used on the test product; and a table of background information appear at the end of this report.

HOMEMAKERS' USE AND OPINIONS OF MILK

The weekly household milk consumption reported by homemakers fell into three usage level groups that were almost equal in size--lower, under 4 1/2 quarts; middle, 4 1/2 to 10 quarts; and higher, more than 10 quarts.

Fresh Milk

Virtually all (96 percent) of the homemakers reported that someone in the household had used fresh milk within the 7 days preceding the initial interview.

About nine in 10 said fresh milk had been used as a beverage, on cereal, and for baking or cooking, and six in 10 said the milk had been used in coffee and tea. They were asked why they had used fresh milk for the indicated purpose(s) rather than some other form of milk. Responses concentrated on taste and convenience, as shown in the tabulation below:

<u>Reasons for Using Fresh Milk</u>	<u>Percent 1/</u>
<u>Taste:</u>	
Tastes better	21
Like the taste	13
<u>Convenience:</u>	
Ready to use; no mixing	13
More convenient	10
Can be delivered; always available	5
Just like it	19
Never used any other kind; habit	15
<u>Health:</u>	
Nutritious, wholesome, contains vitamins, minerals	9
Good for children, builds bones, teeth	3
Other health reasons	2
Better for specific uses such as drinking, cooking ..	6
Richer	4
Miscellaneous	6
Not ascertained; not eligible for question	4
Number of respondents.....	327

1/ Percentages add to more than 100 because some respondents gave more than one reply.

Only about one-fourth of the homemakers reported that they found any disadvantage in using fresh milk. Their main objection, as shown below, was that fresh milk requires refrigeration:

<u>Disadvantages in Using Fresh Milk</u>	<u>Percent 1/</u>
Must be refrigerated	83
More expensive	12
Awkward to transport, store	10
Miscellaneous	8
Number of respondents who mentioned disadvantages	86

1/ Percentages add to more than 100 because some respondents gave more than one reply.

Powdered or Dry Milk

Relatively few homemakers (14 percent) said that anyone in the household had used any kind of dry or powdered milk during the preceding 7 days. However, over one-third of the homemakers (37 percent) said powdered or dry milk had been used in the previous year; the remainder were divided almost equally between those who reported they had used it more than a year ago and those who had never used it.

Those homemakers who said they had not used dry milk within the preceding year (62 percent) were asked the reason. As shown below, their most frequent responses were based on taste, prejudgement of or lack of interest in innovation, general dislike, or the bother of mixing the dry milk with water:

<u>Reasons for Not Using Dry Milk</u>	<u>Percent</u> <u>1/</u>
<u>Taste:</u>	
Dislike taste	12
Does not taste as good as fresh milk	8
Tastes chalky, flat	4
Don't think would like, no desire to try	20
Just didn't like it	15
Too much trouble to mix	14
<u>Consistency:</u>	
Too watery	6
Not rich enough	2
Too gritty, lumpy	1
Have always used fresh milk	8
Miscellaneous	8
Not ascertained	11
<hr/>	
Number of respondents who had not used dry milk in the preceding year	203

1/ Percentages add to more than 100 because some respondents gave more than one reply.

Homemakers who reported using dry milk in the year preceding the interview were asked in what ways their family had used the milk. In baking or cooking was mentioned by about seven homemakers in 10, as a beverage by about five in 10, on cereal by roughly three in 10, and in coffee or tea by two in 10. They were then asked why they had used powdered or dry milk for the indicated purpose(s) rather than some other form of milk. Responses concentrated on economy, convenience, the fact that no refrigeration was needed before reconstitution, and low caloric content:

Reasons for Using Dry Milk

Percent 1/

More economical	30
Convenient, good in an emergency	28
No refrigeration needed (before reconstitution).....	19
Less fattening, fat-free	14
Good for cooking, recipe called for it	10
Doctor's orders	7
Fortifies other milk, adds to nutritional value	6
Just wanted to try it	6
Miscellaneous	7

Number of respondents who reported
using dry milk in the preceding year 122

1/ Percentages add to more than 100 because some respondents gave more than one reply.

About half the homemakers who said they had used dry milk within the preceding year indicated disadvantages in its use. The most frequently mentioned disadvantage was difficulty in preparation, followed closely by concern about consistency and flavor:

Disadvantages in Using Dry Milk

Percent 1/

Difficult to prepare, lumpy	46
Too watery, weak	32
Dislike taste	28
Does not taste as good as fresh milk	19
Miscellaneous	9

Number of respondents who mentioned disadvantages.... 57

1/ Percentages add to more than 100 because some respondents gave more than one reply.

About two in 10 homemakers said that both fresh and dry milk had been used within the previous 30 days. Most of those respondents said that more fresh than dry milk had been used.

Evaporated or Condensed Milk

Respondents who reported that evaporated or condensed milk had been used in their households within the previous 12 months (62 percent) were asked why it had been used rather than some other form of milk. No one reason stood out among those given. The major responses, such as "recipe called for it," "more like cream, richer than milk," "good for cooking," and "prefer it in coffee and tea," were cited by about one or two in 10.

HOMEMAKERS' REACTIONS TO TEST PRODUCT

At the time of the followup interview, which took place about a week after the test product placement had been made, two-thirds of the homemakers had not used all the dry whole milk that had been left with them. The explanation most frequently given was that they hadn't had the opportunity as yet; other reasons given included: "had other milk to use first," "just didn't like it," or "don't use much milk."

Overall Opinions of Test Product

The homemakers were asked their opinions of the test milk compared with regular whole milk, considering the family's overall needs and preferences. As shown in the following tabulation, over four homemakers in 10 rated the dry whole milk equal to or better than regular whole milk; most of the remainder said it was not quite as good as regular whole milk:

<u>Overall Ratings of the Dry Whole Milk</u>	<u>Percent</u>
Considerably better than regular whole milk	3
A little better than regular whole milk	6
Equal to regular whole milk	35
Not quite as good as regular whole milk	36
Not nearly as good as regular whole milk	17
Other responses	1
Not ascertained	2
<hr/>	
Number of respondents	327

Proportionately more of the homemakers age 35 or over than those under 35 rated the dry whole milk equal to or better than regular whole milk. However, there was no apparent relationship between weekly milk consumption in the household and the overall rating given to the test product.

Overall rating of the dry whole milk, by age of homemaker and weekly milk consumption of household

Item	Sample households	Proportion rating test product equal to or better than regular whole milk
	<u>Number</u>	<u>Percent</u>
Age of homemaker:		
Under 35	143	35
35 to 44	58	45
45 and over	122	52
Weekly milk consumption:		
Under 4 1/2 quarts	115	43
4 1/2 to 10 quarts	101	41
More than 10 quarts	111	47

Perceived Advantages and Disadvantages of Test Product

More than seven homemakers in 10 said that they felt this product offered some advantages, and about six in 10 mentioned some disadvantages.

Among those respondents who mentioned advantages, about seven in 10 said that the dry whole milk was easy to store. Reasons also mentioned, but less frequently, were that the milk was: economical (25 percent) and good for emergencies (22 percent):

<u>Advantages of the Dry Whole Milk</u>	<u>Percent 1/</u>
Easy to store, doesn't require refrigeration	72
Economical	25
Good for emergencies	22
Good for cooking	5
Richer	4
Lightweight	3
Always have good milk	3
Miscellaneous	3

Number of respondents who mentioned advantages..... 239

1/ Percentages add to more than 100 because some respondents gave more than one reply.

Since the homemakers were given no indication of a retail price for the test product if it were marketed, the one-fourth who specified "economical" as an advantage were of particular interest. A special analysis was made of the comments of these 60 homemakers: About three in 10 definitely stated that the dry whole milk would be cheaper than fresh whole milk or at least more economical because the dry milk would last longer; about five in 10 thought the dry whole milk would be cheaper; and the remainder, in qualified answers, indicated that it would be an advantage if the dry whole milk cost less than fresh whole milk.

Among those respondents who cited disadvantages, the major dislike was that the dry whole milk took time to prepare. The opinion that it was too foamy was also mentioned, but much less frequently. Only about one in 10 disliked the taste, as shown below:

Disadvantages of the Dry Whole MilkPercent 1/

Takes time to prepare, mix	59
Too foamy	25
Too hard to dissolve	17
Dislike the taste; powdery, chalky taste	9
Leaves a film or residue	4
Too thick; too rich	3
Makes a mess when can opened	3
Doesn't taste as good as fresh whole milk	3
Miscellaneous	4

Number of respondents who mentioned disadvantages ... 190

1/ Percentages add to more than 100 because some respondents gave more than one reply.

As might be expected, there was a relationship between the homemakers' indication of advantages and disadvantages and their attitude considering their families' overall needs and preferences toward the dry whole milk compared with regular whole milk. Ratings of equal to or better than regular whole milk were given by about six in 10 homemakers who mentioned only advantages of the new product, and by only about one in 10 of those who mentioned only disadvantages.

Ratings of the dry whole milk by homemakers who mentioned advantages or disadvantages

Overall ratings	Mentioned advantages only	Mentioned disadvantages only
	<u>Percent</u>	
Considerably better than regular whole milk	8	-
A little better than regular whole milk	8	2
Equal to regular whole milk	46	10
Not quite as good as regular whole milk	31	38
Not nearly as good as regular whole milk	5	48
Not ascertained	2	2
	<u>Number</u>	
Respondents	106	58

Note: - is zero in this sample.

A question of special interest was whether the presence of foam on the reconstituted dry whole milk or the necessary mixing process was dominant in the thinking of those homemakers who were less enthusiastic about the test product. The persons who mentioned "too foamy" or "leaves a film or residue" were therefore isolated as a group and compared with another group that consisted of homemakers who mentioned any disadvantages other than foam or residue. This comparison was made in terms of the overall ratings both groups had assigned to dry whole milk. A similar comparison was made between those who mentioned "takes time to mix" or "too hard to dissolve" and those who did not. This analysis indicated that neither the foam nor mixing considerations seemed to weigh more heavily than other disadvantages among homemakers who rated the test product less favorably than regular whole milk "considering your family's overall needs and preferences."

Opinions of Test Product for Selected Nonbeverage Uses

More than half the homemakers reported the test product had been used on cereal. About the same number indicated it had been used for cooking or baking. Some of the ways the milk was used in cooking or baking were: mashed potatoes, custards and puddings, sauces or gravy, breads, pancakes, cakes or pies, and casseroles; but no one way was indicated by more than two in 10 homemakers. The only other nonbeverage use cited frequently was use in coffee or tea; about four in 10 mentioned this. Only 5 percent of the homemakers said they had used the test product in dry form.

Very few respondents suggested ways to improve the dry whole milk for each reported use, but some homemakers did suggest eliminating the foam from the top of the reconstituted test milk.

In general, the homemakers' evaluations of the test product compared with regular whole milk, when they considered their overall needs and preferences, were more favorable for nonbeverage uses than the reactions cited earlier in the section on overall opinions. The most frequent rating given for each nonbeverage use was that the dry whole milk was equal to regular whole milk.

Ratings of the dry whole milk for nonbeverage use

Ratings	Cooking or baking	On cereal
	-----Percent-----	
Better than regular whole milk	7	5
Equal to regular whole milk	44	37
Not as good as regular whole milk	6	11
Not ascertained	2	1
Did not use dry whole milk this way...	41	46
	-----Number-----	
Respondents	327	327

Willingness to Purchase Test Product

As another indication of attitude toward the dry whole milk, a list of prices for this milk in relation to the cost of fresh whole milk was shown to each homemaker. She was asked to indicate the highest price at which she would buy any of the dry whole milk for use as a beverage. Comparatively few (18 percent) cited a price equal to or more than the price for fresh whole milk. More than four in 10 said they would buy the product only if the price per quart equivalent were lower than that of fresh whole milk--most of these respondents stated at least 4 cents a quart less. More than three in 10 said they would not buy it for use as a beverage at any price. As the following tabulation shows, responses were generally similar regardless of the weekly milk usage group into which the household fell:

Highest Price per Quart Equivalent Homemakers Would Pay for the Dry Whole Milk

	<u>Percent</u>
2-4 cents more than fresh whole milk	3
Same price as fresh whole milk	15
Less than fresh whole milk	44
2 cents less	7
3 cents less	6
4 cents less	16
More than 4 cents less	15
Don't think would buy at any price	35
Not ascertained	3
	<hr/>
Number of respondents	327

At the time of the study, ARS scientists who developed the product believed that if the dry whole milk were produced in quantity, an amount that would reconstitute into a fluid quart could probably be sold for about 2 cents less than a quart of fresh whole milk. Therefore, all of the homemakers who indicated that they would buy the product at 2 cents a quart less than fresh whole milk or some higher price were asked: "Suppose the dry whole milk cost 2 cents a quart less than fresh whole milk; What proportion of the milk you use as a beverage would you buy in this form?" Among the 82 eligible respondents, almost half (48 percent) indicated that they would buy the dry whole milk in place of one-half or more of the fresh whole milk used as a beverage. However, there was no apparent relationship between household weekly milk consumption and the indicated amount of test product substitution.

Answers to questions such as the two reported above cannot be considered predictors of future purchases. Such questions do indicate whether respondents were pleased with the product. They might buy it, depending on a wide variety of factors such as price, packaging, advertising and display space, and cost of competing forms of milk.

Reactions to Mixing the Product

The homemakers had been instructed to empty the contents of the test dry whole milk can into a quart-and-a-half (or larger size) container, add 3 2/3 cups of cold water, and stir or shake the container vigorously or use a blender or hand mixer. Homemakers were asked how they had mixed the test product and to comment about their experiences in mixing it. Most of the respondents could not state what size container or how much water had been used to mix the dry whole milk. Generally, the homemakers said they either stirred or shook the mixture, and about one-quarter said they had used a blender or mixer for better mixing results.

More than half the respondents (57 percent) made unfavorable comments about their experience in reconstituting the product. The two main dislikes, each mentioned by about one-quarter of the respondents, were that the milk was difficult or time-consuming to mix and had too much foam on top. About four in 10 homemakers commented favorably; most of these favorable comments were simply that the dry whole milk was easy to mix.

Only a few respondents (14 percent) offered any suggestions for improving the mixing instructions. Ways to more easily liquefy the dry whole milk were mentioned; for example, emphasize the desirability of using a blender or mixer, add water gradually, use warm water, and use more water.

Opinions of Package Size

The amount of test product in each container reconstituted into a quart of fluid whole milk. The homemakers were asked if it would be more convenient for them if the milk were packaged in a larger or smaller size. Most of the respondents (73 percent) were satisfied with the size. As would be expected, more than half the respondents who indicated a preference for a larger size were from households that used more than 10 quarts of milk a week.

HOUSEHOLD MEMBERS' REACTIONS TO TEST PRODUCT

Preference Ratings by Household Members Age 12 or Over

In the cooperating households, the homemaker asked each person age 12 or over who normally drank milk to try the test product as a beverage and to fill out a preference rating card for the dry whole milk and for regular whole milk. A nine-point hedonic scale was used ranging from "Like extremely," with a numerical value of 9, to "Dislike extremely," with a numerical value of 1. In addition, all household members who completed the rating card were to indicate whether the test milk was warm or cool at the time it was rated--about eight in 10 indicated that it was cool--and any comments they had about the test product.

The ratings were analyzed by sex and age of household member. The differences in the ratings given by males and females were slight, and the pattern of ratings was the same. Therefore, the results are presented here only by age groups.

The majority of the household members age 12 or over who rated the test milk gave it a favorable rating, and four in 10 chose the top two categories in indicating their opinion of the dry whole milk. However, regular whole milk was rated more favorably than the test milk, with the overwhelming majority giving it a favorable rating, and about seven in 10 rated it in the top two categories. The average ratings were 6.39 for the dry whole milk and 7.57 for regular whole milk (see table following).

The evaluation of regular whole milk was more favorable than that for the test product among all age groups, but the sizable differences occurred among those under age 30, and the largest differences between average ratings for regular whole milk and the dry whole milk occurred among the group age 20-29. One might have expected the older people to be less receptive to the new product or at least as resistant to it as the younger people. But after age 30, negativity toward the dry whole milk fell off markedly, whereas the rating of regular whole milk was roughly the same for all age groups.

A comparison of the frequency of drinking regular whole milk among the males and females showed that proportionately more males than females in all age groups indicated drinking this milk more frequently. But again, the pattern among age groups was the same: The proportions within an age group drinking regular whole milk "at least 5 or 6 times a week" fell off progressively from the youngest group to the group age 50 to 59, with an upturn for those 60 and over. No significant differences were found in the opinions on the dry whole milk that might have been related to the raters' frequency of drinking fluid whole milk.

Only one-quarter of the household members who rated the test milk made any unfavorable comments about it. The major objections, which paralleled those given by the homemakers during the personal interview, were that the milk was too foamy or had scum on top and that it was difficult to mix. About the same number of household members made favorable comments such as: "the test milk tasted as good as fresh;" "it has a good flavor, sweet taste;" and "I liked it." As would be expected, more women than men said it was good in cooking, and some respondents indicated that they thought it was better than other fresh milk substitutes.

Reactions of Household Members Under Age 12

Although household members under age 12 were not asked to complete a preference rating card, their reactions to the product were considered to be of interest. Respondents were therefore asked if their children under age 12 had tried the dry whole milk as a beverage; and, if so, what the children's reactions were to the test milk compared with regular whole milk. Among the 36 percent of the households where children under age 12 had tried the test milk, about two-thirds of the homemakers said their children liked the test milk as well as or better than regular whole milk. In the households where the children's reactions were negative, the major dislikes cited were the foam on top and the taste of the dry whole milk.

Ratings of the dry whole milk and regular fluid whole milk as a beverage, by age of household member

Ratings	Age 1/									
	Total		12-19		20-29		30-39		40-49	
	The dry milk	Fluid milk	The dry milk	Fluid milk	The dry milk	Fluid milk	The dry milk	Fluid milk	The dry milk	Fluid milk
	Percent									
Like extremely	8	29	12	33	5	33	9	28	7	23
Like very much	32	39	29	43	21	33	31	36	30	44
Like moderately	23	18	20	10	20	16	26	24	34	18
Like slightly	11	4	13	8	15	7	11	2	9	4
Neither like nor dislike	6	3	6	3	7	2	6	3	7	4
Dislike slightly	8	2	8	1	12	4	8	2	7	2
Dislike moderately	2	1	1	-	5	*	2	2	2	1
Dislike very much	6	2	6	-	10	3	4	2	2	2
Dislike extremely	4	2	5	2	5	2	3	1	2	2
	Number									
Household members	682	694	113	114	183	189	119	120	105	109
Average	6.39	7.57	6.37	7.83	5.62	7.54	6.56	7.55	6.72	7.45
Difference between the average ratings of regular whole milk and the dry whole milk				1.46		1.92		0.99	0.73	
		1.18								0.53
										0.62
										7.04
										7.57

1/Excludes four females whose age was not ascertained.
Note: *is less than 1 percent and - is zero in this sample.

THE SAMPLE AND BACKGROUND INFORMATION

Sample Design and Sampling Method

The 327 persons interviewed in this survey were a sample of homemakers living in private households in the incorporated city of Alexandria, Va. This city was chosen because of its proximity to the office conducting the study and because the socioeconomic characteristics of the residents were not atypical.

The sample was an area probability sample of households; within each household, the eligible respondent was the homemaker--the person with major responsibility for purchasing and preparing food for the members of the household. Through use of city block statistics from the 1960 Census for the city of Alexandria, 300 sampling units were randomly selected. For each sampling unit, the interviewer was provided with a detailed map and instructions for listing the households included. Systematic random procedures were used to designate every "nth" household as one in which an interview was to be taken. A total of 573 addresses was designated. Of this number, 26 were vacant and six were either nonexistent or not housing units. The remaining 541 comprised the eligible group of sample households. As many as three callbacks were made to complete interviews with homemakers who were not at home or were otherwise unavailable on the first visit to the household. No deviation from the specified procedures and no substitutions were permitted.

Contacts were completed with 466 (86 percent) of the eligible respondents. Of these, 334 (62 percent) agreed to cooperate in testing the new product by using it in the same ways they normally used milk. The major reasons given by those who did not wish to test the product were based on nonuse or very little use of milk in the household or an unwillingness to try the new product. Seven homemakers were not available for the followup interview; thus, 327 homemakers participated in both the placement and the followup interviews.

Sampling Tolerances

Since a sample was interviewed rather than the total population, the findings are subject to sampling error. The following table of sampling tolerances is presented as a guide in evaluating the findings that involved the homemaker's responses. The chances are approximately 95 in 100 that the survey result does not vary, plus or minus, by more than the indicated number of percentage points from the result that would have been obtained had the same procedures been used in an effort to interview all homemakers in the population.

Sampling tolerances 1/

Item	Size of sample				
	50	100	150	200	300
For percentages around:					
10 or 90	9	7	6	5	4
20 or 80	11	10	8	7	6
30 or 70	13	11	9	8	6
40 or 60	14	12	10	8	7
50	14	12	10	9	7

1/ Two standard errors: 95-percent confidence level.

Background Information About the Households
in the Sample

<u>Characteristics</u>	<u>Percent</u>
Homemaker:	
Female	92
Male	8
Homemaker's age:	
34 or under	44
35 to 44	18
45 to 64	29
65 and over	8
Not ascertained	1
Homemaker's highest grade of school completed:	
8th or less	13
Some high school, 9-11	21
Completed high school	32
Some college	33
Not ascertained	1
Homemaker's employment status:	
Not employed	59
Full time	33
Part time	8
Number of people in household:	
1 or 2	39
3 or 4	41
5 or more	20
Total annual family income:	
\$4,999 or less	28
\$5,000 to 7,999	32
\$8,000 and over	36
Not ascertained	4
Number of respondents	327

INSTRUCTIONS FOR THE HOMEMAKER

1. HOW TO MIX DRY WHOLE MILK

- a. Empty contents into a quart-and-a-half (or larger size) container.
- b. Add three and two-thirds cups of cold water.
- c. Shake vigorously or use blender or hand-mixer.
- d. The mixed milk may be used immediately or stored in refrigerator for further cooling.

(PERISHABLE AFTER MIXING -- KEEP COOL)

2. HOW TO USE THE PRODUCT

During the next few days we would like you to use the sample of dry whole milk in the ways that you would ordinarily use milk.

3. RATING THE PRODUCT

In addition, we would like to have each member of your family 12 years of age and over rate this product as a beverage. Please follow these rules in rating the product as a beverage:

- a. Mix enough dry milk for a glass for each person 12 years and over who normally drinks milk.
- b. Give each person a glass of the milk and ask him to try it.
- c. Have each person indicate on a rating scale how he liked the product as a beverage. Please have each person complete his rating before there is any discussion.
- d. As each person completes the rating, he (or she) should indicate age, sex and how often he (or she) drinks milk.

This is a sample of
dry whole milk, under
development by U. S.
Department of Agricul-
ture scientists.



DRY WHOLE MILK

DIRECTIONS

Empty contents into 1½
quart container; Add ¾
cups of cold water. Stir
or shake vigorously.

MAKES 1 QUART

May be used immediately or
stored in refrigerator for
further cooling. Perishable
after recombining--keep cool.

Utilization Research and Development Agricultural Research Service
U.S. DEPARTMENT OF AGRICULTURE

QUESTIONNAIRES AND PREFERENCE RATING CARD

With the exception of check-box material, office record information, and free-answer space, the questionnaires used for this study are reproduced below in entirety. The cards used are reproduced at the end of the questionnaires. Responses to a few of the questions have not been reported because the data were not of value. Instructions to interviewers are in upper case letters.

Placement Questionnaire

My name is _____. I am from The George Washington University. We are conducting a survey on dry whole milk for the U.S. Department of Agriculture, and I would like to speak with the homemaker here...This is a new product and we are asking a sample of homemakers in Alexandria to test it. I will leave a supply of the milk with you and ask you to use it in ways that you normally use milk. I will return later to talk with you about what you and your family think of it. First, I have a few questions to ask.

1. [HAND RESPONDENT CARD A] Which one of these statements describes when anyone in this household last used any fresh milk? [IF WITHIN LAST 12 MONTHS, SKIP TO Q. 3]
2. [IF NOT WITHIN LAST 12 MONTHS]: Why haven't you used it? (SKIP TO QUESTION 6)
3. [IF USED WITHIN THE LAST 12 MONTHS]: In what ways did your family use it? [CIRCLE ALL THAT APPLY] Beverage, Baking/cooking, Cereal, Coffee/tea, Other [SPECIFY]. 4. Why do you use fresh milk for (this purpose) (these purposes) rather than some other form of milk?
- 5a. Have you found any disadvantages in using fresh milk? 5b. [IF "YES"] What?
6. [USE CARD A] Which one of these statements describes when anyone in this household last used any powdered or dry milk? [IF WITHIN THE LAST 12 MONTHS, SKIP TO QUESTION 8]
7. [IF NOT WITHIN LAST 12 MONTHS]: Why haven't you used it? [SKIP TO QUESTION 12]
8. [IF USED WITHIN THE LAST 12 MONTHS]: In what ways did your family use it? [CIRCLE ALL THAT APPLY] Beverage, Baking/cooking, Cereal, Coffee/tea, Other [SPECIFY]. 9. Why do you use powdered or dry milk for (this purpose) (these purposes) rather than some other form of milk? 10a. Have you found any disadvantages in using powdered or dry milk? 10b. [IF "YES"] What?
11. [ASK ONLY IF BOTH FRESH AND DRY MILK USED WITHIN LAST 30 DAYS] Altogether, do you use more fresh milk or more dry milk?
12. Within the last 12 months, has anyone in this household used any other kind of milk; that is, evaporated or condensed milk, buttermilk, half-and-half and so on? [CIRCLE ALL THAT APPLY]. 13. [ASK ONLY ABOUT EVAPORATED OR CONDENSED] Why do you use it rather than some other form of milk?
14. I would like some information about your household, such as the sex and age of household members and their relationship to household head. Let's start with the head of the household. [CIRCLE THE NUMBER OF THE LINE ON WHICH THE RESPONDENT IS LISTED]
15. [USE CARD B] Please look at this card and indicate into which group your family income fell last year. Please include income for all employed family members and from all sources.
16. What was the highest grade you completed in school? [CIRCLE ONE NUMBER]
17. Are you employed? [IF "YES"] Full-time, Part-time.

I am going to leave you a supply of dry whole milk. How many quarts of milk of all kinds do you use each week? _____ Qts. How much of this milk is used as a beverage? _____ Qts. I will leave you _____ cans. Please try it in whatever ways you ordinarily use milk. I will come back in a few days to ask you your opinions about the milk. Also I would like you and each member of your family 12 years of age and over to drink some of the milk and then rate it as a beverage, using the scale printed on this card. [SHOW THE CARD TO THE HOMEMAKER AND EXPLAIN HOW THE RATING IS TO BE MADE]. I am going to leave you _____ cards, one for each person in your family 12 years and over.

[IF HOMEMAKER IS UNWILLING TO ACCEPT THE DRY MILK, CHECK THIS SPACE AND RECORD HER REASONS ON THE OPPOSITE COLUMN OF THIS PAGE _____]

Followup Questionnaire

[_____ NUMBER OF RATING CARDS TO BE COLLECTED. PICK UP RATING CARDS AND CHECK EACH TO VERIFY THAT RATINGS HAVE BEEN MADE AND ALL OTHER QUESTIONS HAVE BEEN ANSWERED. IF ANY CARD IS NOT FILLED IN, RECORD REASON FOR NONRESPONSE ON BACK OF CARD.] [_____ CHECK IF THERE ARE ANY CHILDREN UNDER 12. IF NO CHILD UNDER 12, SKIP TO Q. 4]

1. Did your children under 12 try the dry whole milk as a beverage? [IF NO, SKIP TO Q. 4]
2. What did they think of it, compared to regular whole milk? Did they seem to like it: Better, Just as Well, or Not as Well, Other answer [EXPLAIN BELOW]
3. Were there any things about it they did not like so well? What things?
4. Did you use the milk for cooking or baking? [IF NO, SKIP TO Q. 8]
5. For what kind of cooking or baking did you use it?
6. [HAND RESPONDENT CARD C] Which one of these ratings best describes your opinion of dry whole milk compared to regular whole milk for cooking or baking? [IF OTHER ANSWER EXPLAIN BELOW]
7. Are there any ways in which it could be improved for use in cooking and baking?
8. Did you use the milk on cereal? [IF NO, SKIP TO Q. 11]
9. [CARD C] Which one of these ratings best describes your opinion of dry whole milk compared to regular whole milk for use on cereal?
10. Are there any ways in which it could be improved for use on cereal?
11. Did you use the milk in any way other than those we have talked about? [IF NO, SKIP TO Q. 15]
12. In what other ways did you use it? [IF COFFEE/TEA IS MENTIONED, THEN Q. 13 APPLIES TO COFFEE/TEA]
13. [CARD C] Which one of these ratings best describes your opinion of dry whole milk compared to regular whole milk for those other uses?
14. Are there any ways in which it could be improved for those uses?
15. Did you use it in dry form? For what uses? [IF "YES," LIST BELOW]
16. [CARD C] Which one of these ratings best describes your opinion of dry whole milk compared to regular whole milk, considering your family's over-all needs and preferences?
17. Are there any advantages in using this milk?
18. Are there any disadvantages in using this milk?
19. [USE CARD D] Would you look at this card, please, and tell me what is the highest price at which you would buy any dry whole milk for use as a beverage? [IF OTHER ANSWER, SPECIFY BELOW]
20. [ASK IF WOULD BUY AT "2¢ A QUART LESS" OR SOME HIGHER PRICE] Suppose the dry whole milk cost 2¢ a quart less than fresh whole milk: What proportion of the milk you use as a beverage would you buy in this form? Would it be: Less than one-fourth, between a fourth and a half, between a half and three-fourths, or three-fourths or more? [IF OTHER ANSWER, SPECIFY BELOW]
21. How did you mix the milk? [GIVE DETAILS ON PROCEDURES AND UTENSILS]
22. What comments do you have about your experiences mixing the milk?
23. Do you have suggestions for improving the instructions for mixing the product? [IF "YES"] What would you suggest? [WRITE SUGGESTIONS BELOW]
24. Have you used all of the dry whole milk that was given to you? [IF NO, SKIP TO Q. 26]
25. [IF "YES"] On what day did you use the last of it _____
(month) (date)
26. [IF "NO"] Why didn't you use all of it?
27. Would it be more convenient for you if the milk were packaged in a different-sized container? [IF "YES"] Would you prefer a larger or smaller size? COMMENTS:

CARDS USED IN THE INTERVIEWS

CARD A

Within the last 7 days 1
 Within the last 30 days 2
 Within the last 12 months 3
 More than 12 months ago 4
 Never used it..... 5

CARD B

Under \$1,000 1
 \$1,000 - \$1,999 2
 \$2,000 - \$2,999 3
 \$3,000 - \$3,999 4
 \$4,000 - \$4,999 5
 \$5,000 - \$5,999 6
 \$6,000 - \$6,999 7
 \$7,000 - \$7,999 8
 \$8,000 - \$9,999 9
 \$10,000 - \$14,999 0
 \$15,000 - and over X

CARD C

1. Dry whole milk considerably better
 2. Dry whole milk a little better
 3. Dry whole milk equal
 4. Dry whole milk not quite as good
 5. Dry whole milk not nearly as good
 6. Other answer

CARD D

1. 4¢ a quart more than fresh whole milk
 2. 3¢ a quart more than fresh whole milk
 3. 2¢ a quart more than fresh whole milk
 4. The same price as fresh whole milk
 5. 2¢ a quart less than fresh whole milk
 6. 3¢ a quart less than fresh whole milk
 7. 4¢ a quart less than fresh whole milk
 8. Cheaper than 4¢ a quart less
 9. Don't think I would buy it at any price
 0. Other answer

Preference Rating Card

1. Please taste the milk, then put an "X" on the line next to the statement which best describes what you think of the milk as a beverage: Like Extremely, Like Very Much, Like Moderately, Like Slightly, Neither Like Nor Dislike, Dislike Slightly, Dislike Moderately, Dislike Very Much, Dislike Extremely.
2. Was the milk (check one): _____ warm or _____ cool?
3. Any comments about the milk you tested?
4. Age: _____ years old.
5. Sex (check one): _____ Male _____ Female
6. Now please put an "X" on the line next to the statement which best describes what you think of regular whole milk as a beverage: Like Extremely, Like Very Much, Like Moderately, Like Slightly, Neither Like Nor Dislike, Dislike Slightly, Dislike Moderately, Dislike Very Much, Dislike Extremely.
7. How often do you usually drink whole milk? (Check one) At least five or six times a week, Three or four times a week, About once a week, Less than once a week, Never drink whole milk.

UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C. 20250

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE, \$300



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